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OPTIMIZATION OF FEEDING OF PATIENTS WITH PATHOLOGY OF THE MAXILLOFACIAL REGION USING A SPECIAL DEVICE

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Introduction. Mouth opening limitation is a frequent complication of different diseases of the maxillofacial region of various etiologies. Such pathologies include traumatic fractures of the upper and lower jaws, inflammatory diseases of the maxillofacial region, benign and malignant tumors, including those requiring reconstructive surgery after radical treatment, secondary temporomandibular dysfunction, diffuse damage to the connective tissue in the facial area. This complication significantly worsens the quality of life of this group of patients. This complication significantly worsens the quality of life of this group of patients. This complication significantly worsens the quality of life of these patients.

Aim. To develop and test a device for feeding patients with severe mouth opening limitation, which can significantly improve the quality of life of such patients.

Objects and methods. Design and 3D modeling of the developed device were carried out. Using 3D printing, a prototype device was made from certified biocompatible plastic.

Results. The design of the device is convenient to use and reliable in operation, allows you to individually adjust it for a particular patient with different degrees of mouth opening, as well as use different degrees of food grinding and adjust the size of the gap through which food enters the patient's oral cavity.

Conclusion. The use of the device is convenient for both the patient and the nursing staff. Independent use of the device by the patient does not cause difficulties.

Keywords: nutrition; mouth opening limitation; quality of life.

ОПТИМИЗАЦИЯ КОРМЛЕНИЯ ПАЦИЕНТОВ С ПАТОЛОГИЕЙ ЧЕЛЮСТНО-ЛИЦЕВОЙ ОБЛАСТИ С ИСПОЛЬЗОВАНИЕМ СПЕЦИАЛЬНОГО УСТРОЙСТВА

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Введение. Ограничение открывания рта является одним из осложнений ряда заболеваний челюстно-лицевой области различной этиологии. Среди такой патологии можно выделить травматические переломы верхней и нижней челюстей, воспалительные заболевания челюстно-лицевой области доброкачественные и злокачественные опухоли, в том числе требующие выполнения реконструктивных операций после радикального лечения, вторичная дисфункция височно-нижнечелюстного, диффузное поражение соединительной ткани в области лица. Такое осложнение существенно ухудшает качество жизни данной группы пациентов. Данное осложнение существенно ухудшает качество жизни данной группы пациентов.

Цель работы. Разработать и апробировать устройство для кормления пациентов с выраженным ограничением открывания рта, которое позволит улучшить качество жизни таких пациентов.

Объекты и методы. Осуществлено проектирование и 3D-моделирование разработанного устройства. С помощью 3D-печати изготовлен опытный образец устройства из сертифицированного биосовместимого пластика.

Результаты. Конструктивное выполнение устройства обладает удобством в применении и надежностью в эксплуатации, позволяет индивидуально настраивать его под конкретного пациента с различной степенью открывания рта, а также использовать различную степень измельчения пищи и регулировать размер рабочей части, через которую пища поступает в ротовую полость пациента.

Заключение. Использование устройства удобно как для пациента, так и для медработника, осуществляющего кормление. Самостоятельное использование устройства пациентом затруднений не вызывает.

Ключевые слова: питание; ограничение открывания рта; качество жизни.

Introduction. Mouth opening limitation is a frequent complication of different diseases of the maxillofacial region, both inflammatory and traumatic

etiology. Examples of such pathology are traumatic fractures of the upper and lower jaws, inflammatory diseases of the maxillofacial area (for example, sialadenitis, phlegmons and abscesses of the maxillofacial area), benign and malignant tumors, secondary dysfunction of the temporomandibular joint against the background of long-term rheumatic diseases, damage to connective tissue in the facial area [2, 3].

The main requirements for providing nutrients to the human body are the energy and chemical adequacy of the diet, its balanced composition, full compliance of the chemical composition and structure of food with the enzymatic systems of the body. The most physiological, ensuring the best absorption of food consumed is oral nutrition, therefore it is most preferable in all groups of patients.

Thus, the nutrition of patients with limited oral opening angle is complicated by a number of factors: difficulties in ensuring the adequacy and rationality of nutrition; unphysiological feeding and associated discomfort, which leads to a decrease in the frequency of meals and lack of appetite in patients; the need to have a second person, usually a medical worker, to carry out feeding. The above factors indicate a decrease in the quality of life of this group of patients. This fact has necessitated the development of a device for feeding patients with a limited opening angle of the mouth, which will allow them to be avoided or minimized

Aim. To develop and test a device for feeding patients with severe limitations in mouth opening, which will improve the quality of life of such patients.

Objects and methods. A prototype of the device was developed using digital modeling. Calculations were made, design documentation was developed, materials were selected for the manufacture of a prototype. 3D modeling of the device has been completed.

A prototype device was made from certified biocompatible plastic using 3D printing.

The intellectual property for the developed device is protected by the Patent of the Republic of Belarus [1].

Results. The developed device for feeding patients with pathology of limited opening angle of the mouth consists of a food reservoir, made in the form of an opening container, connected to the rectangular body of the device through an adapter coupling, while the body of the device has a working part with a sliding limiter (Figure 1) [1].

This design of the device is simple, convenient to use and reliable in operation, it allows you to individually configure it for a specific patient with varying degrees of mouth opening, as well as use different degrees of food

grinding and adjust the size of the gap through which food enters the patient's oral cavity; the food reservoir allows you to strictly determine and dose the amount of food for one meal, which is necessary to comply with the therapeutic nutrition regimen; the design of the device implies the possibility of its quick disassembly, and thus allows the patient to independently clean and process the device [1]. The adapter is available in two configurations: a proprietary tank connector or a universal PCO 1881 thread.

The practical use of the device is as follows. The patient or healthcare professional detaches the food reservoir from the device body and fills it with food. After filling, the food reservoir is fixed to the body, which prepares the device for operation. The sliding stopper is installed in the desired position, corresponding to the angle of mouth opening and the nature of the food. The device is brought to the mouth, an angle is created that allows the working part to be conveniently inserted into the patient's oral cavity, due to which food enters the patient's oral cavity through the gap. After feeding is completed, the device is disassembled and further hygienic and sanitary treatment is carried out.

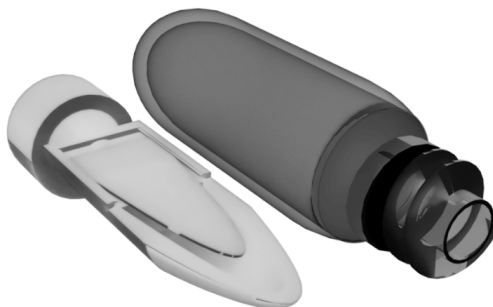


Figure 1 — Three-dimensional image of a device and a food reservoir.

Conclusion. A device has been developed for feeding patients with pathology of limited mouth opening. The use of the proposed device allows you to accurately adapt it to a specific patient and to different consistencies of food, changing the size of the scooped part, and measuring the exact amount of food for a meal. The device is suitable for independent use by the patient, does not require special skills to operate it, and allows for easy hygienic treatment.

References.

1. Device for feeding patients with pathology of limited mouth opening : Patent of the Republic of Belarus 12837 : МРК А 61J 7/00 / I. V. Jadevich, V. V. Konchak, N. N. Cherchenko; applicants and copyright holders : I. V. Jadevich, V. V. Konchak, N. N. Cherchenko. — N 20210210; zajavl. 11.08.2021, opubl. 28.02.2022, Bjul. № 1. — 3 p.
2. Drobyshev, A. Ju. Minimally invasive surgical treatment of the temporo-mandibular joint in patients with various rheumatic diseases / A. Ju. Drobyshev, I. D. Zaslavskij, T. V. Dubinina // Modern Rheumatology J. — 2017. — Vol. 11, N 4. — P. 12–17. doi: 10.14412/1996-7012-2017-4-12-17
3. Rheumatic diseases. In 3 volumes. Volume Fundamentals of Rheumatology / H. Dzhon [et al.]. — Moscow : GJeOTAR-Media, 2017. — 368 p.